

ing of infection, grave sepsis, and death. This fact constitutes the strongest argument for early operation where rupture is suspected, or diagnosed with certainty. Under no condition should preliminary catheterization be attempted in the face of this syndrome, which is practically always accompanied by a complete or almost complete rupture of the urethra. Attempts at catheterization increase trauma, create false pockets in the perineum, cause fresh hemorrhage, introduce infection, and in some cases convert an incomplete to a complete tear. Furthermore, even though one succeeds in passing a catheter to the bladder under such conditions, the ultimate result after healing has occurred is generally stricture formation due to the intense peri-urethral infiltration and reaction. Stricture formation is what we desire especially to prevent, because once present it is generally vicious and may require operation later. In other words, Garlock feels that by not using the indwelling catheter the tendency to stricture formation is lessened. The procedure to be followed in these cases, then, is drainage of the perineum and suprapubic cystotomy, letting nature attend to the healing of the urethra. After the initial traumatic reaction has subsided it may then be advisable to use an indwelling catheter, provided the urethra does not close spontaneously.

Even though the original straddle injury has been so slight as to produce no actual rupture or tear in the urethra, the patient may experience stricture formation and even complete retention coming on weeks, months, or even years later. It is imperative, therefore, even in slight injuries which do not interfere with urination at the time, to have these patients report periodically for dilatation with sounds for a long time, thus obviating late stricture formation. Traumatic strictures are notoriously more resistant and difficult to deal with than strictures of gonorrheal origin. It is of interest, as Lowsley has pointed out, that many of these straddle-injury cases suffer the occurrence of sexual impotence.

The late cases, which are often seen as a result of inadequate early treatment (and sometimes in spite of adequate early treatment), offer serious problems which may tax the skill and resourcefulness of the urologist to the utmost. The chief problem of the late case, seen perhaps months or years after the original injury, is the management of stricture, which is generally of a most rigid and refractory type. An attack of complete retention of urine may be the presenting symptom which makes the patient seek urgent relief. Filiforms and followers are called into play, but if they cannot be passed, cystotomy or external urethrotomy is mandatory, depending upon one's judgment in the individual case. Incidentally, if the stricture cannot be traversed with a filiform, it is sometimes possible to achieve success with a well-oiled filiform passed through a panendoscope under direct vision. If the stricture can be traversed, it may then be possible to maintain dilatation of sufficient degree by periodic passage of sounds. If the stricture is too resistant to dilate readily, as is often the case, and is attended by chills and reactions, an internal urethrotomy should be done. Following this procedure it is permissible to insert a large indwelling catheter (26 or 28 F.) for a week to establish patency, and to follow this up at necessary intervals with sounds. In my experience, an internal urethrotomy in late cases is always better than an external urethrotomy, if it can be done. An external urethrotomy, with excision of the scar and reunion of the proximal and distal urethra on an indwelling catheter splint, may be followed by partial incontinence, and reformation of scar tissue requiring further dilatation with sounds. When external urethrotomy is indicated, the method of Pasteau, modified to suit the individual case, should be followed.

It is important to bear in mind the damaging effects of stricture of long standing on the upper urinary tract. Ascending pyelonephritis and hydronephrosis are sequelae which may result in death from urosepsis or uremia.

JAY J. CRANE, M.D. (1921 Wilshire Boulevard, Los Angeles).—We have just listened to a well-written paper on a subject which is of great interest to all urologists, although all of us do not have the opportunity to see such a large series of cases as those just described by Doctor Beach.

The subject has been well handled, and the paper when published will command the attention of all surgeons; for

nowhere in our present-day texts or even in our current literature, is there such a complete description of this subject.

Having cared for only a very small number of such patients in comparison with the large series Doctor Beach has seen, I feel that anything I may say will not lend much weight. However, I should like to emphasize the necessity of recognizing the nature of the injury early, in order that treatment may be carried out before extravasation of urine and blood is too extensive, especially in those patients who void spontaneously after the injury.

I also wish to mention that a cystogram taken at the time of the first catheterization will be of great assistance in ruling out a ruptured bladder. If after a catheter is passed, and no rupture of the bladder is found, then many of these patients can be cared for successfully with only a retention catheter; if catheterization, however, cannot be accomplished, then one should never hesitate to drain suprapubically and explore the abdomen at the same time if necessary.

PELVIC FLOOR AND ADJACENT VISCERA: THEIR PLASTIC SURGERY*

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San Francisco

DISCUSSION by H. A. Stephenson, M.D., San Francisco; H. N. Shaw, M.D., San Francisco; R. Glenn Craig, M.D., San Francisco; L. A. Emge, M.D., San Francisco.

A CONSIDERATION of the recent literature dealing with operations designed to correct damage to the birth canal and its supports, and to correct certain alleged pathological positions of the generative organs, leads one to believe that some of the significant factors in the statics of the female pelvic viscera are being overlooked. Certain it is that the behavior of many surgeons has been little influenced by the notable work of R. H. Paramore,¹ published almost twenty years ago.

OBJECT OF THE PAPER

The object of this paper is to outline briefly what appears to this writer to be the salient features in several useful plastic operations upon the pelvic floor and contiguous viscera. It is not intended in any sense to give a complete description of operative technique in the operations discussed, but rather to point out what should be the common feature in the various procedures designed to produce the desired results. Careful study of the various surgical methods described in textbooks and even more recent publications will show that credit for good results is often given to unimportant detail, while the significant factors go unstressed.

NORMAL ANATOMIC AND PHYSIOLOGIC FACTORS

In order to discuss the mechanics of repair, it is first necessary to consider the normal anatomic and physiologic factors concerned in pelvic visceral support.¹ It is important to understand that, except for its gaseous content, the abdominal and pelvic contents represent one visceral mass which

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is incompressible, deformable and, within limits, movable, and that this visceral mass throughout the life of an individual is continually being squeezed by its muscular walls. The pressure in this mass is subject to sudden and wide variation, and is caused by contraction of the thoracic diaphragm, the abdominal wall and pelvic floor muscles. Such pressure, originating in the upper abdomen, courses generally downward and, due to the lumbar spinal lordosis, is directed against the anterior abdominal wall a short distance above the symphysis. From here it is directed backward, and its repeated impactions produce the hollow of the sacrum from which the forces are reflected throughout the pelvic contents.

The diaphragm, which forms the pelvic floor, is composed of striated muscles with their fascial coverings, the levatores ani and the coccygei. Anteriorly, just behind the symphysis pubis, is a defect in the pelvic floor, through which escape three visceral canals to reach the surface of the body: the urethra, the vagina, and the rectum. This defect has been called the pelvic floor aperture.¹ The levatores ani—the only muscles which concern us in supportive operations—are bilateral muscular sheets which arise in front from the symphysis and laterally from the fascia covering the obdurator internus, and from the spine of the ischium. The fibers pass backward and medially surrounding this aperture, to insert into a median osseofibrous raphe and the terminal part of the sacrum. Below this upper sheet of the levators lies another muscular layer, a most important one in surgical repair, the puborectalis, which is inserted into the lower margin of the symphysis pubis, and completely encircles the aperture in the pelvic floor. In all of the operations designed to increase the tone of the pelvic floor, the puborectalis is the most accessible. Contraction of the fibers in the upper levator layer, the pubococcygeus, causes lateral constriction of the pelvic floor aperture, while contraction of the puborectalis layer exerts a sphincter-like squeeze of the aperture from behind the rectum forward toward the pubic bone.

VITAL STRUCTURES IN VISCERAL SUPPORT

There is ever recurring discussion among surgeons concerning the importance of the fascia and condensations of visceral connective tissue in pelvic visceral support; but it seems reasonable to agree with Paramore that the vital structure in preventing visceral protrusion through the pelvic aperture is the living tonic, striated muscle disposed about this aperture, and resisting downward thrusts.

The condensations of the visceral connective tissue stretch when the pelvic floor becomes inefficient, because of the inability of the musculature to withstand the pressures. The muscular floor depends, it is true, upon its connections, that is, the aponeuroses and bones. Without these rigid attachments the muscles would be useless. However, the changes which cause prolapse lie in the muscles and not in the connective tissue, which is greatly thickened in such cases.

THE PELVIC FASCIA

The pelvic fascia, about which there has been so much confusion in the past, is now known to be similar to fascias elsewhere in the body. It simply forms sheaths for muscles and has no direct connections with any pelvic viscera. It is this parietal pelvic fascia, together with the periosteum of the bones, which forms the real limits of the pelvic cavity, just as the transversalis fascia limits the abdominal cavity.

FASCIA ENDOPELVINA

The intricate layers of the so-called fascia endopelvina, which were thought to form ligaments supporting pelvic viscera (such as the true ligaments of the bladder, anterior and lateral, Mackenrodt's ligament running laterally from the upper part of the vagina and the cervix, and the sacrouterine ligaments) are simply condensations in the visceral connective tissue. While it is true that some of these thickenings contain smooth muscle fibers, their only rôle in influencing the position of the pelvic viscera is in virtue of the space they occupy and, because of their incompressibility, they are a part of the pelvic contents. These connective tissue thickenings are not present at birth, but are the later result of tensions set up in the loose, connective tissue which fills in the space between the limits of the pelvic cavity and its contained viscera.¹

MENGERT'S CADAVER STUDIES

Recent experimental work upon cadavers by Mengert,² in which he found the uteri were easily pulled down into the position of prolapse only after section of the dense connective tissue in the base of the broad ligaments and upper paravaginal regions, was thought to prove that the muscular pelvic diaphragm plays no important rôle in pelvic visceral support. There are several factors in these experiments which make it inapplicable to conditions in the living, such as the opened abdomen, the pulling downward on the uterus from below and the loss of contractibility of the muscles. What seems to have been proved is that section of certain connective tissue structures allows the uterus to be pulled down easily when the pelvic diaphragm is unable to contract.

A disturbance in the nerve supply to the levators in infancy results in uterine prolapse soon after the activity of crying raises the intrapelvic pressure.

RÔLE OF THE UNDAMAGED STRIATED MUSCLE

It seems obvious that undamaged striated muscle is the only tissue in the body which can continuously respond successfully in time and in degree so as to maintain a physiologic equilibrium of the pelvic viscera in the face of downward thrusts produced from above by the sudden contraction of striated muscles. With failure of the muscle, pelvic viscera begin to descend through the pelvic aperture in spite of fascia and greatly thickened connective tissue, and this generally occurs at a time of life when the pressure in the visceral mass is reduced. This reduction in abdominopelvic pressures is caused by atrophy of the muscular walls.

THE SMOOTH MUSCLE LIGAMENTS

The various smooth muscle ligaments of the uterus have been by some assigned a rôle in pelvic support, and have been used by surgeons of the past in vain attempts to cure uterine descent by their shortening. Although these are now generally considered useless procedures for prolapse, they are used in suspension operations on the uterus in attempts to cause anteversion of the organ. Studies on the cadaver, observations during surgical operations with the peritoneal cavity open, even bimanual examination of the uterus with the abdomen closed—all have a tendency to lead us into erroneous conclusions regarding the uterus. The rigidity of the uterus is due to the tonic contraction of its muscular walls; but to our tactile sense it suggests weight and immobility and, in contrast to the practically impalpable surrounding viscera, it seems isolated. In retroversion the greater ease of palpation intensifies this impression and strongly suggests abnormality, especially as we recall idealized anatomical illustrations of the proper uterine position.

POSITION PECULIARITIES OF THE UTERUS

It is well to remember that the uterus is completely surrounded by an incompressible medium and that its position is largely determined by changes in the volume of neighboring viscera such as the bladder and rectum, and by the disposition of small intestines as caused by the thrusts of increased pressures coming down from above. In most women the pressures from above tend to press the uterus forward and downward upon the bladder, and the higher the intrapelvic pressure the greater the uterine immobility. Orthopedic factors which change the direction of the downward thrusts may distribute the viscera differently so that small intestinal loops lie anterior to the uterus. No amount of ligamentary shortening will change permanently the position of the uterus if the postoperative position is resisted by pressures initiated by striated muscles. Suspensions of the cervical and vaginal stumps, after partial and complete hysterectomy, are useless gestures for the same reason—that is, that smooth muscle cannot long withstand forces generated by striated muscles.

INDICATIONS FOR OPERATIONS TO CHANGE UTERUS POSITION

Fortunately, indications for operations designed to change positions of the uterus are disappearing, as we better interpret physical findings and symptoms. A high percentage of the backaches in women are orthopedic problems, even when appearing only in association with the menses. Chamberlain, at Temple University, seems to have shown an increased mobility of the pelvic articulations during menstruation, similar (except in degree) to that occurring during pregnancy.

The weight of the uterus is almost, if not completely nullified by the pressure and incompressibility of its surrounding medium, and can be considered as floating in this medium unless it is adherent to immovable structures by inflammatory or malignant change.

The lower the abdominopelvic pressure the more movable becomes the uterus, so that hypermotility and retroversion are found most often in asthenic individuals. This low pressure is probably the explanation of the engorged veins so often described as caused by retroversion. The circulation of the abdomen and pelvis is markedly influenced by the abdominopelvic pressure, and rapid emptying of the veins only occurs when normally high pressures are maintained. The sensation of weight in the pelvis complained of by many patients is not due to a heavy or displaced uterus, but is the patient's interpretation of symptoms arising from distended vein walls.

PLASTIC OPERATIONS UPON THE CERVIX

Plastic operations upon the cervix, whether for repair of lacerations or for the removal of infected glandular structures, have become markedly simplified since Sturmdorf described his tracheloplasty in 1919. This operation supplanted many of the earlier procedures, because it removed pathology with a minimum of disturbance in physiological function. However, the conception that the Sturmdorf flaps of mucous membrane, when inverted into the cervical excavation, reproduce a normal relationship between vaginal vault and cervix, is erroneous. If the flaps stay as originally sutured, the cervix is pushed out of the vagina, thereby flattening the vaginal vault. Bilateral scars result, which are often mistakenly diagnosed as lacerations when only palpated. Conization of the cervix with the endotherm, using the Hyams tip, removes the pathology as effectively as the Sturmdorf enucleation, and gives a much better plastic result. If done quickly there is very little destruction of tissue, as is the case in cauterization and, therefore, little or no slough or secondary stenosis.

Just as the Sturmdorf technique could be applied at a higher level as an amputation of the cervix, so the endotherm can be used with a straight blade in cervical amputation. Control of the bleeding should be by deep suture. Whether the suturing of loosened mucous membrane flaps in the excavation is necessary or even advisable, may be questioned.

Routine inspection of the vaginal vault eight to ten days after the operation will often show the flaps loosened and hanging loosely in the upper vagina. Some of us are of the opinion that healing of the excavation by granulation and epithelization, such as occurs in conization, will give better plastic results and more nearly preserve the normal appearance of the vagino-uterine junction.

PROCIDENTIA

Procidentia can be considered as a hernia of the uterus through the pelvic floor aperture, and represents a pathologic equilibrium established with the descent and dilatation of the aperture as contrasted with the physiologic equilibrium which exists when the pelvic floor is competent. It is always accompanied in its descent by varying amounts of bladder and rectal wall. Surgical cure in procidentia depends upon reduction of the hernia and restoring tone to the damaged levator

fibers. Reduction of the hernia consists, in the case of bladder and rectum, in dissecting these structures free from uterine and vaginal attachments; and, in the case of the uterus in its removal, interposition, reposition or amputation of the swollen cervix. The method of opening the vaginal wall is of little consequence, as long as adequate exposure is obtained; and the shape of the denudation of the vaginal wall, if any, is also unimportant, as long as snug closure can be made.

Interposition of the uterus below the bladder is an effective method of treating prolapse, and except for the fact of retention of a potentially dangerous organ, and a slight outward bowing effect upon the ureters, can be considered a useful operation. Those who advocate interposition for prolapse make as one necessary condition in its use, that the uterus must not be atrophic. Now the uterus will later become atrophic, but recurrences after this operation are very few, so that, except as a temporary feature, the good result must be due to some detail of the operation other than that produced by the position or size of the body of the uterus itself. It must be understood that no treatment of prolapse or cystocele can be considered complete until the levator muscles have been restored in tone.

OPERATIONS FOR THE RESTORATION OF TONE

Operations for the restoration in tone of the damaged muscular mechanism for closure of the pelvic floor aperture are not anatomical restorations in any sense. The operation is called perineorrhaphy, although the surgery in the perineum is only incidental to, and not at all a necessary part of the surgery of the pelvic floor. The perineal body, about which so much has been made in the literature of the past, lies below the pelvic floor and contains the intrinsic closure mechanism for the rectum and vagina. Complete rupture or incision of the perineal body in the absence of damage to the levators contributes nothing to the production of prolapse.

All methods of increasing the efficiency of the levator muscles consist in pulling bundles of their fibers (mainly in the puborectales layer) out of their usual course and suturing them together in the midline between the vagina and the rectum. This converts a damaged and elongated U-shaped muscle into an approximate figure-of-eight, thus in effect shortening the muscle and thereby increasing its tone, and enabling it once more to close effectively the pelvic floor aperture.

OPERATIVE TECHNIQUE OF SOMERS

The writer would like to call attention to an operation for repair of the levator muscles first described by Dr. George B. Somers in 1903.⁸ The special point in technique as outlined by him concerned the suturing of the muscle bundles. After a high, triangular denudation of the posterior vaginal mucosa, the levator ani bundles are approximated by a layer of continuous silkworm gut sutures. The sutures are inserted through the vaginal mucous membrane above the apex of the denudation and are continued as mattress sutures,

closing the wound longitudinally and emerging through the skin of the perineum. The number of sutures is determined by the depth of the wound, the first being passed along its deepest part. After the mattress suture has transversed the length of the wound to emerge through the skin it is pulled taut, and this brings the tissues in the sides of the wound into contact. Each succeeding suture is placed more superficially until the entire wound is closed. The projecting ends of the silkworm sutures are left long and protected by a lead shot.

This method of perineorrhaphy closure holds the muscle and connective tissue firmly in the midline between the vagina and rectum, with little or no strangulating effect; is not as painful as usual methods of suturing, and produces no palpable transverse ridge in the reconstructed vagina. Healing is uniformly good due to the tolerance of tissues for silkworm gut and the absence of strangulation. Swelling can occur, the tissue sliding along the sutures, none of them being tied; and if infection of the wound occurs, the sutures will be effective drains while still splinting the wound edges. We have used flexible steel sutures for demonstration, and although the postoperative results were very good, the difficulties in insertion and removal are greater than silkworm gut.

ESSENTIAL ELEMENTS IN VISCERAL DESCENT OPERATIONS

The essential elements, therefore, in operations designed to correct visceral descent are:

1. Replacement of the herniated structures after dissection has sufficiently mobilized them.
2. Perineorrhaphy to reestablish effective closure of the pelvic floor aperture. This is done by suturing the two arms of the levators ani, with their fascial coverings, together between the rectum and the vagina.
3. The use of condensations of visceral connective tissues about the bladder and cervix uteri, the sacro-uterine, the lateral parametrial and pubocervical thickenings. These structures give immediate, although temporary, postoperative immobilization to the replaced structures and allow a firmer union to occur in the myorrhaphy.
4. When small intestinal loops accompany the bladder or rectum through the relaxed aperture, the condition is called enterocele; and cure of this condition requires, in addition to the extensive mobilization of the herniated viscera, the removal of the peritoneal sac and closure of the gap created, using the connective tissue structures previously referred to.

Recurrences in the large enterocele after operation will occur more frequently than in any other repair, because the muscular defect is the greatest. It may be necessary to use partial or complete colectomy to cure the condition. This obliteration of the vagina can be done very simply after recurrence has occurred, and should be reserved for the treatment of recurrences or in large prolapse with enterocele in patients considered to be poor surgical risks.

COMMENT

The controversy, then, between those who believe the connective tissue or fascia the most important supporting structure, and the adherents to the theory that muscle is the real support, can be reconciled at least as regards the utility of these structures in surgery. It will be noted that the excellent operations designed for prolapse by Fothergill, Neel, Rawls, and many others, always include a posterior colporrhaphy. It seems to this writer that, although he is thoroughly convinced by the researches of Paramore, that the visceral connective tissue (the uterine, vesical and paravaginal ligaments) is of no value in determining the position or contributing to the support of pelvic viscera normally, except as it is a part of the incompressible visceral mass and not a part of the pelvic floor, still it can play an indispensable part in reconstructive operations. He believes also that many plastic operations would fail but for the temporary protection given by use of these thickenings of visceral connective tissue to the healing myorrhaphy.

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DISCUSSION

H. A. STEPHENSON, M. D. (490 Post Street, San Francisco).—Doctor Pettit sets forth clearly and fully the value of certain pelvic structures in plastic surgery of the pelvic floor and contiguous viscera.

His theory of the causation of pelvic herniae is interesting and, to me, logical. If generally accepted, it should obviate the unjustifiable employment of certain operations involving the various pelvic ligaments for uterine malpositions. Hospital records already show that the operation of uterine suspension is now less frequently done than a few years ago.

All obstetricians will agree with the treatment of the cervix as described. Conization is the best method for patients still in the child-bearing age. Much obstetrical grief has resulted after the repairs and amputations formerly done by ambitious surgeons. In most instances this was due to the sacrifice of too much cervical tissue.

The careful reading of this paper by surgeons, obstetricians, and gynecologists should result in better plastic surgery of the pelvic floor and, therefore, better results for the patient requiring such surgery.

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H. N. SHAW, M. D. (901 Pacific Mutual Building, San Francisco).—Doctor Pettit has explained simply and clearly the relations and functions of the supporting structures of the pelvis. In many papers on this subject the descriptions of the pelvic fascias are so complicated that the reader is left hopelessly confused.

I know of no operation in which there are more variations of technique than in repair of the perineum, yet, thanks to an excellent blood supply, the end-results are nearly identical. One man stresses the importance of a "butterfly incision," the next uses a wedge shape, another employs silkworm gut with lead shot for approximation, while his associate regards them as relics of barbarism and uses buried catgut.

In the treatment of lacerated cervixes we prefer radial cauterization in general to the various trachelorrhaphies. I have seen end-results of cervical repairs, done by excellent men, that looked like starfish. A cautery takes about

a minute or two, and about twenty-four hours' hospitalization, while a careful cervical repair often takes a half-hour and keeps the patient in the hospital ten days.

One of the main reasons for repairing the cervix is to prevent cancer. A very early cancer would be destroyed by adequate cautery, while a very fine-looking repair might spread the malignancy like wild fire.

✱

R. GLENN CRAIG, M. D. (490 Post Street, San Francisco).—The indications for operations advocated to correct anatomical abnormalities of the uterus are steadily declining. As Doctor Pettit has pointed out, the adjacent uterine structures are the "guy-ropes," but the position of the uterus is maintained by the pressure of the soft, mouldable mass above. This we need not discuss. You might wonder why anyone would wish to talk of the anatomical structures of the pelvic floor, since they have been well known and well recognized for several decades. The present paper is based on anatomical concepts and operative procedures emphasized two or three decades ago. If one is interested enough to watch the various procedures carried out in the operating room, the answer will be obvious: the overabundance of tissue available for suturing deludes the operator into forgetting the importance of the restoration of the anatomical structures to their former normal position. While no operation is easier to do, none in gynecology is so frequently done so badly. For this reason Doctor Pettit is to be commended for so clearly emphasizing the necessity of fundamental anatomical and physiologic knowledge. I agree with the principles outlined by him, and hope we all shall have a better anatomical conception before our next attempt, of what we are trying to accomplish.

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L. A. EMGE, M. D. (2000 Van Ness Avenue, San Francisco).—Doctor Pettit's very frank statement of his own ideas about the mechanism of pelvic support deserves serious attention; so many statements of previous writers, giving undue credit to the pelvic fascia, have gone unchallenged and are automatically repeated in reviews of the subject. It is, therefore, refreshing to find someone who has enough courage to challenge established notions. I fully agree with Doctor Pettit that the pelvic diaphragm as a whole must depend upon functioning muscle fibers. A fascial membrane devoid of these fibers would have to possess a tremendous tensile strength and unusual thickness to withstand the abdominal pressure of an active individual. Wherever the musculature of the diaphragm has been weakened, pressure ultimately will produce a pelvic hernia. It may be argued that in old age this musculature atrophies, and that prolapse is not the usual result. However, with advanced age the pelvic diaphragm contracts and thickens, if not previously weakened, and if one realizes that physical activity is also decreased during that period, one can readily understand nature's way of regulating the supporting mechanism of the pelvis to prevent herniation.

Doctor Pettit did not discuss the work done at Stanford by Doctor Blaisdell in 1917, which includes both experimental and comparative anatomical studies. Blaisdell fully realized the importance of living muscles, and demonstrated their presence and response to functional changes in various animals and the different ages in man. Blaisdell pointed out that the basal ligaments were not individual components in the true sense of ligaments, but that they represent interchangeable groups of musculo-elastic structures to which he gave the name "suspensorium fibro-elasticum." Paramore's splendid contribution is considerably broader in its deductions than Blaisdell's, but it in no way detracts from Blaisdell's conclusions.

As far as the application of this knowledge to pelvic repairs is concerned, it perhaps is not out of place to say that any extensive repair would include muscle tissue either purposely or accidentally. Unfortunately, the very best of dissection and the strictest adherence to principles of plastic surgery will not always yield the desired end-result. The patient is relieved for some months, but herniation recurs because the supporting diaphragm has lost its contractility. In such instances there remains nothing to do except to resort to one of the operations which obliterates the vagina.